

### **REMARKS**

Applicants thank the Examiner for the thorough examination given the present application.

#### **Status of the Claims**

Claims 1, 3-6, and 8-19 are pending in the above-identified application. Claims 10-18 are currently withdrawn from consideration. Support for the amendment to claim 1 can be found in claim 7 as originally filed. As such, claim 7 is cancelled herein. Claim 2 is also cancelled herein. Support for new claim 19 can be found in Examples 1, 2, 4, and 6 of the present specification. Thus, no new matter has been added. Based upon the above considerations, entry of the present amendment is respectfully requested.

In view of the following remarks, Applicants respectfully request that the Examiner withdraw all rejections and allow the currently pending claims.

#### **Election/Restriction**

The Examiner notes that a provisional election was made with traverse to prosecute the invention of Group I, claims 1-9. Applicants affirm this election and note that the Examiner has withdrawn claims 10-18 from further consideration as being drawn to a non-elected invention.

Applicants respectfully traverse the restriction requirement. According to MPEP 803, if the search and examination of an entire application can be made without a serious burden, the Examiner *must* examine it on the merits, even though it includes claims to independent or distinct inventions. Since Group I (claims 1-9, directed to a method of producing a nanomaterial) and Group II (claims 10-18, directed to the nanomaterial) are so closely related in subject matter, the Examiner is necessarily searching Group II when conducting a search for Group I. Thus, the additional group identified by the Examiner could efficiently be examined in this application along with the elected invention without undue burden on the Examiner or the USPTO.

Applicants respectfully submit that new claim 19 belongs to the elected invention of Group I.

**Foreign Priority**

The Examiner notes that certified copies of the foreign priority documents JP 2004-032280 and JP 2003-129347 have not yet been entered into the file wrapper for this application. However, the “Notification Concerning Submission or Transmittal of Priority Document” shows that these documents should have been submitted previously. PAIR confirms that the “Notification Concerning Submission or Transmittal of Priority Document” was submitted on November 4, 2005. Applicants respectfully request the Examiner to acknowledge receipt of the certified copies of the priority documents based on this information.

**Issues under 35 U.S.C. § 102**

Claims 1-3 and 8-9 are rejected under 35 U.S.C. § 102(b) as being anticipated by Cuisin et al. Applicants respectfully traverse. Reconsideration and withdrawal of this rejection are respectfully requested.

**Legal Standard for Determining Anticipation**

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). “When a claim covers several structures or compositions, either generically or as alternatives, the claim is deemed anticipated if any of the structures or compositions within the scope of the claim is known in the prior art.” *Brown v. 3M*, 265 F.3d 1349, 1351, 60 USPQ2d 1375, 1376 (Fed. Cir. 2001). “The identical invention must be shown in as complete detail as is contained in the ... claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an *ipsisimilis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990).

*Distinctions over the Cited Reference*

Claim 1 is amended by incorporating the subject matter of claim 7, which was not included in this rejection. As such, Cuisin et al. fail to disclose each and every element of independent claim 1, and those claims dependent thereon.

Accordingly, the present invention is not anticipated by Cuisin et al. since the reference does not teach or provide for each of the limitations recited in the pending claims.

**Issues under 35 U.S.C. § 103**

1) Claims 4-5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Cuisin et al. in view of Li et al.

2) Claim 6 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Cuisin et al. in view of Kenausis et al.

3) Claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Cuisin et al. in view of Fujikawa et al.

Applicants respectfully traverse. Reconsideration and withdrawal of this rejection are respectfully requested.

*Legal Standard for Determining Prima Facie Obviousness*

MPEP 2141 sets forth the guidelines in determining obviousness. First, the Examiner has to take into account the factual inquiries set forth in *Graham v. John Deere*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), which has provided the controlling framework for an obviousness analysis. The four *Graham* factors are:

- (a) determining the scope and content of the prior art;
- (b) ascertaining the differences between the prior art and the claims in issue;
- (c) resolving the level of ordinary skill in the pertinent art; and
- (d) evaluating any evidence of secondary considerations.

*Graham v. John Deere*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966).

Second, the Examiner has to provide some rationale for determining obviousness. MPEP 2143 sets forth some rationales that were established in the recent decision of *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007).

As the MPEP directs, all claim limitations must be considered in view of the cited prior art in order to establish a *prima facie* case of obviousness. *See* MPEP 2143.03.

*Distinctions over the Cited References*

As discussed above, claim 1 is amended by incorporating the subject matter of claim 7, which was not included in the first two obviousness rejections. As such, Cuisin et al. in view of Li et al. or Kenausis et al. fail to disclose each and every element of independent claim 1, and those claims dependent thereon.

Turning to the rejection of Cuisin et al. in view of Fujikawa et al., one of ordinary skill in the art would have no reason or rationale to combine the two references. Furthermore, the arrangement of the present invention, which is not disclosed by the cited references, produces a unique effect such that a nanomaterial having a shape that faithfully replicates or transcribes the shape of the formed mold can be produced very easily.

In Cuisin et al., a void having a shape of a triangular prism is provided to a Si template coated with a PMMA resist by X-ray lithography. A liquid precursor of TiO<sub>2</sub> prepared by the sol-gel method is infiltrated thereto to form a titania structure (page 3508, Section IV).

In Fujikawa et al., a titania thin film is formed on a mold by performing a sol-gel process of titanium alkoxide with the use of a carboxyl group on a resin bead mold.

As recited in claim 1, the present invention is a method in which a mold is formed by lithography on a solid substrate having a surface coated with a resist material containing a hydroxyl group or a carboxyl group, and the sol-gel method is applied directly to the mold so that a metal oxide or the like is obtained.

It is known that a chemical change is caused in a region subjected to lithography in a method for forming a mold by using lithography. Accordingly, one of ordinary skill in the art would consider that a hydroxyl group or a carboxyl group, which is present before the mold is formed, undergoes a chemical change. Therefore, one of ordinary skill in the art would not obtain a metal oxide by applying the sol-gel method directly to the mold. That is, one of ordinary skill in the art would have no reason or rationale to combine Cuisin et al. and Fujikawa et al.

Cuisin et al. relate to a technique in which fine pores on a PMMA template are filled with a dielectric material (titania) so that a 3D photonic structure is formed. As is described in Cuisin et al., one of ordinary skill in the art generally causes a titania solution to infiltrate in the fine pores in order to fill the fine pores efficiently. Therefore, one of ordinary skill in the art would not use the sol-gel method, which is known as a technique for forming a thin film because infiltration is better in efficiency than the sol-gel method for the reason that the sol-gel method requires repetitive operations for filling the fine pores.

Moreover, according to Cuisin et al., the mold is filled with a liquid precursor of  $\text{TiO}_2$  prepared by the sol-gel method. On the other hand, according to the present invention recited in amended claim 1, the sol-gel method is applied on the mold. Cuisin et al. and the present invention are thus clearly different.

To establish a *prima facie* case of obviousness of a claimed invention, all of the claim limitations must be disclosed by the cited references. As discussed above, Cuisin et al. in view of Fujikawa et al. fail to disclose all of the claim limitations of independent claim 1, and those claims dependent thereon. Accordingly, the combination of references does not render the present invention obvious.

Furthermore, the cited references or the knowledge in the art provide no reason or rationale that would allow one of ordinary skill in the art to arrive at the present invention as claimed. Therefore, a *prima facie* case of obviousness has not been established, and withdrawal of the outstanding rejection is respectfully requested. Any contentions of the USPTO to the contrary must be reconsidered at present.

**New Claim 19**

Applicants have newly added claim 19 in an effort to further define the scope of protection owed to Applicants. Applicants respectfully submit that claim 19 is allowable for the reasons given above.

Moreover, none of the cited references disclose the arrangement according to new claim 19 of the present invention. For example, when a mold is prepared by a method other than lithography as described in Fujikawa et al., the sol-gel method can be applied to the mold without activating the surface of the mold by a method such as an oxygen plasma method or an ozone oxidation method.

In stark contrast, when a mold is prepared by lithography, a chemical change caused by the lithography may decrease the efficiency of application of the sol-gel method. The arrangement of new claim 19 resolves such a problem, and one of ordinary skill in the art would not arrive at the arrangement on the basis of the cited references or the knowledge in the art.

As such, Applicants respectfully assert that claim 19 clearly defines over the cited references, and an early action to this effect is earnestly solicited.

**CONCLUSION**

A full and complete response has been made to all issues as cited in the Office Action. Applicants respectfully request that a timely Notice of Allowance issue for the present case clearly indicating that each of claims 1, 3-6, 8-9, and 19 are allowed and patentable under the provisions of title 35 of the United States Code.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Chad M. Rink, Reg. No. 58,258 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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